which are embodied in each species." He treats of the origin of the deep-sea fauna from that of the littoral region. It is impossible here to follow him in his most valuable speculations. In one matter, however, I would venture to express a difference of opinion. He regards the littoral forms of invertebrates as migrating into the deep sea by the following process: Their free-swimming larvæ are supposed to be carried out by currents far from land, and then, having completed their development, to sink to the bottom, where a very few survive and thrive. It is hardly to be conceived that any animal, especially in a young and tender condition, could suddenly adapt itself to the vast change of conditions entailed in a move from littoral to deep-sea life. It seems to me much more likely that the move of animals from the shallow to the deep sea has been of the most gradual kind, and spread over long series of generations, which may have migrated downwards, perhaps a fathom or so in a century, partly by very slight migrations of the adults, partly by very short excursions of larvæ. Thus alone, by almost insensible steps, could animals, such as those under consideration, be enabled to survive an entire change of food, light, temperature, and surroundings.

NOTES

WE have received a box of plants from the Ben Nevis Observatory, including specimens of *Saxifraga stellaris*, from a height of 4400 feet, and *Armeria vulgaris*, from 4370 feet. The plants of these two species, with the numerous flowers which covered them, are as large and well grown as any we have ever seen at lower levels. There is also a specimen of *Gnaphalium supinum*, fairly well grown and in flower, from a height of 4370 feet, and a single plant of *Oxyria reniformis* from 4390 feet, also fairly well grown, but not in flower. The interest attached to the collection is the great height at which they have been found growing in full vigour, the heights being greater than those hitherto given in our "Floras" as the limits of growth of the species in the British Islands. In the case of *Armeria vulgaris* the height is considerably greater, 3800 feet being the limit assigned to this species in Hooker's "British Flora."

THE Hygienic Congress has voted a resolution requesting the Dutch Government to convoke an International Conference on Cholera, for the purpose of establishing a permanent International Epidemical Committee, and preparing an international penal sanitary code. The Congress has denounced the modern system of education and competitive examinations as injurious to health.

ON the afternoon of Tuesday, August 12, the foundation-stone of the new Meteorological Observatory at Falmouth was laid by the Right Hon. the Earl of Mount Edgcumbe, the President of the Royal Cornwall Polytechnic Society, in the presence of an assembly of over 400 persons. Some eighteen months ago the Meteorological Council of London gave notice that they intended to maintain only three first-class Observatories in the British Isles, and that the grants to four out of the seven then existing would cease on December 31, 1883. The three which they decided on continuing to subsidise were Kew, Valentia, and Aberdeen, but in view of the good work done and the value of the observations, the Council expressed the hope that local efforts would succeed in maintaining the Observatories at the other four stations. The Meteorological Committee of the Royal Cornwall Polytechnic Society, which has the local management of the Observatory, made strenuous efforts to retain the institution in Falmouth, and, after much negotiation, the Meteorological Office agreed to continue their grant of 250*l.* a year, provided a new building were erected on a site approved by them, at some distance from the harbour, so as to be free from the disturbing influences on the wind which the harbour and its surroundings were supposed to cause. The Polytechnic Society took the matter up with great zeal and determination, and the result has been that matters in connection with the new Observatory have become sufficiently matured to admit of the foundation-stone being laid. The new Observatory is situate at the top of Killigrew Street, opposite Belmont. It will not take the shape of the present one, with its high octagonal tower, but will be built in the form of a villa residence, one portion to be the dwelling-house of the superintendent (Mr. E. Kitto, F.R.Met.S.), the other to be specially constructed for the reception of the various instruments. The apparatus in the present Observatory will be transferred to the new one, and the observations now carried on will be continued without alteration, so that the Falmouth Observatory will still be one of the first-class Observatories of the United Kingdom, under the control of the Meteorological Office. The instruments are a barograph, for recording the changes of the barometer; a thermograph, for recording the variations of both the dry and the wet bulb thermometers; the anemograph, to measure the force and direction of the wind; a sunshine recorder; and a self-registering rain-gauge. In addition to these, the Royal Society have made a grant for the purchase of a complete set of magnetographs for recording the declination of the needle, and the force of the magnetic currents. Although these will entail an extra annual expense of 50*l.* a year, the Polytechnic Society has boldly undertaken the responsibility of this work. Seeing that the great value of magnetic observations depends to a large extent on their being taken simultaneously and continuously at stations far removed from one another, and that there is now no first-class magnetic Observatory in the British Isles west of Oxford, Falmouth Observatory may be expected to supply a valuable additional data to our knowledge of this comparatively little-known subject. The Observatory will be under the superintendence of Mr. E. Kitto, the Secretary of the Royal Cornwall Polytechnic Society.

PROF. C. V. RILEY, U.S. Entomologist, and Curator of Insects in the U.S. National Museum, left for home on the 23rd, expecting to arrive in time for the meeting of the American Association for the Advancement of Science in Philadelphia. During his two month's sojourn in Europe he has twice been on the Continent, and has visited correspondents and acquaintances both there and in England, examining the insect collections in various museums, and especially in our own at South Kensington. He speaks favourably of the lasting influence for good which the International Forestry Exhibition at Edinburgh will have, and of the Serrel serigraph—an American invention which has of late years been perfected in Lyons, and which he thinks is destined to revolutionise silk-reeling and profoundly influence silk-culture, which is just now attracting unusual attention in the States. He was also much interested with the investigations into the life-habits of the *Aphididæ* that are being carried on by Jules Lichtenstein at Montpellier, and with the thoroughness with which the French authorities encourage experimental research in advanced agriculture. He received a warm welcome at Montpellier, whither he went at the invitation of the French Minister of Agriculture to explain some new methods of dealing with the Phylloxera, and where he found his own recommendations of previous years so fully carried out. He was also surprised at the very extensive and successful experiments with American vines carried on at Pageset near Nîmes. At a meeting of the Société d'Agriculture d'Hérault, held on June 30, he read a paper entitled "Quelques Mots sur les Insecticides aux États-Unis, et proposition d'un nouveau remède," which appears in full, with an account of the discussion, &c., in *Le Messager Agricole* for July 10, 1884. The "new" remedy is kerosene emulsion, which has been successfully used, especially against *Coccidæ*, in the States. Its application against the Phylloxera is recommended in much the same manner as is used with regard to bisulphate of carbon; the proportions recommended are 300 or 400 grammes of the emulsion in 40 litres of water.

THE Russian Ministry of Marine has distributed among several learned societies a plan for despatching a Russian expedition to the North Pole, starting from North-Eastern Siberia or Jeannette Island, discovered by the *Jeannette* Expedition, and proceeding entirely on foot over the ice in several parties, with large depots in the rear. It is thought that there are many islands north of Jeannette Island which may be explored.

THE following lecture demonstrations will be given in the Hygienic Laboratory at the International Health Exhibition during the forthcoming week by Mr. Charles E. Cassal, F.C.S., Chief Demonstrator:—Tuesday, September 2, Arsenic in Wall Papers and Articles of Clothing; Wednesday, September 3, Drinking-Water; Friday, September 5, Common Food Adulterations. The lectures will commence at 4 p.m.

WHILE at Newcastle last week, the Prince of Wales opened a new Library and Museum of Natural History.

HAVING been asked by M. Wilkens if there are not among the plants of Central Asia remains of the Tertiary period corresponding to those which have been discovered among the animals, Dr. A. Regel, in a letter from Tashkend, which has just appeared in the *Bulletin de la Société des Naturalistes de Moscou*, answers that to say anything about the subject would require a closer comparison with fossil plants. This he could not possibly make during his journey. Still, he points out how many plants in the lowlands and in the wild spurs of the highlands have quite special characters: it is sufficient to mention the plants with leather-like leaves, the Salsolaceæ without leaves, which recall the vegetation of Australia and Africa, or the Ericaceæ-like Reaumuriaceæ of Jungaria. He considers, however, such observations "rather æsthetical," and not sufficiently conclusive; he likes better to collect the necessary material for ulterior work.

PROF. RAOUL PICTET, of the University of Geneva, communicates to a local journal a short memoir of his friend, Baron Thenard, who died at his Château of Talmay on August 8. The late Baron was the son of the illustrious chemist of the same name, and, like him, he devoted his life and his fortune to the service of science. The late M. Thenard was especially distinguished for his investigations in agricultural chemistry—investigations which obtained for him in 1865 admission to the French Institute. An extensive landowner in the Departments of the Côte d'Or and Saône-et-Loire, he paid great attention to the perfection of agricultural machinery and implements, to improved methods of husbandry, the discovery of more efficient fertilisers, and the introduction of new fruits and vegetables. In his laboratories at Paris and at Talmay Baron Thenard devoted himself with rare energy to the elaboration of new methods of organic analysis. Some of the substances he desired to examine he placed in closed circuits, full of pure oxygen, in order to measure how much of the gas was absorbed during the process of combustion, the circulation of the gas being actuated by mercury pumps of the Baron's own invention, which Prof. Pictet describes as singularly ingenious pieces of mechanism.

IT is proposed to form, at the Academy of Sciences of St. Petersburg, a special Committee for the concentration of all observations on meteorology, magnetism, rainfall, and thunderstorms, which are now made in Russia, partly under the direction of the Central Physical Observatory, and, to a great extent, by the initiative of the Geographical Society, the Departments of Ways and Communications, Agriculture, and so on, or privately. The Committee will consist of members of the Academy of Sciences, the Geographical Society, and those Ministries which grant sums of money for meteorological observations.

THE last number of the *Izvestia* of the East Siberian branch of the Geographical Society (vol. xiv. fasc. 4 and 5) contains some interesting notes on the paths that connect Verkhoyansk with Yakutsk, with two maps of the country, by M. Gorokhoff; a note on the Ike-Aral settlement in Transbaikalia, by M. Mikhailoff; and letters from the Polar meteorological station at Sagastyr. The last of these is dated November 25, 1883, and we notice with pleasure that the zeal of the scientific staff of the station continues unabated; the news that they have been allowed to stay for a second winter at the station has been received by them with great pleasure; and Dr. Bunge, already on his journey home, returned immediately from Bulun as soon as he met with the Cossack who brought a letter from the Geographical Society granting the necessary money for a second year's stay at the mouth of the Lena.

IT has been resolved, it seems, to drain the beautiful Merjelen Lake, seen by all tourists who climb the Eggishorn and visit the great Aletsch glacier. From time to time it breaks its icy barriers, leaps in a mad torrent into the bed of the Marsa, and spreads terror and destruction in all the valley of the Upper Rhone. The Merjelen contains 10,000,000 cubic metres of water, is 50 m. deep at the point where it is bounded by the Aletsch glacier, and 12·50 m. at the opposite extremity. The basin of the lake is 1500 m. long, its direction is from west to east, and at the eastern end is the overflow. It is here that the proposed operation will be effected. The opening, 540 m. long and 12·50 m. deep, will thus be at the back of the lake, and its effect will be to lower its level by 12·50 m., and diminish its volume by about one-half, the present mean depth being some 25 m., and although, so say the engineers, the operation may not absolutely prevent future floods, they will be rendered thereby both much rarer and far less dangerous.

La Lumière Électrique has sent a scientific mission of six of its staff in order to report on the Exhibition of Philadelphia and the state of electrical industries in America.

AN Imperial decree, issued this month, interdicts the delivery from Russian circulating libraries to their subscribers of the scientific works of the following authors:—Agassiz, Büchner, Huxley, Lubbock, Lewes, Moleschott, Reclus, Adam Smith, Spencer, Vogt, and Zimmermann. The works of Charles Darwin have already been submitted to the same interdiction.

THE principal article in the current number of *Petermann's Mittheilungen* is on the Trans-Caspian and the neighbouring regions, based on the travels of Lessar. It deals with Atek, the roads from Saraks and Merv to Herat, including four days in Afghanistan, Meshed, the road from Saraks to Merv, with an account of the latter town, and Merv to Bokhara. The paper is accompanied by a map of Merv and the Russo-Persian frontier. Another paper, of present importance (also with a map) is one on the territory of the International Association on the Congo.

A CORRESPONDENT of the *Times* from Pekin, writing on mining in China, refers to the various obstacles which have stood in the way of progress in this direction in the Middle Kingdom. First there is the mysterious but powerful *fêng-shui*, or geomantic influences, an all-pervading superstition, but occasionally elastic, and yielding to expediency, as the spread of telegraphs in the country during the past two years has demonstrated. Then comes the innate suspicion and dislike of foreigners, by whom the mineral wealth of China has been explored, and the importance of working it demonstrated. But "the most efficient obstacle of all" is the ignorance of the officials of the application of science to industry. The long and absorbing devotion to Chinese literature which is necessary to obtain official employment renders any other study, even did the taste or the means of pursuing it exist, all but impossible. The rulers of China fear to avail themselves largely of the services of the "base mechanical" foreigner, unless as a humble instrument, which they cannot always be sure that he will consent to remain. Nevertheless marked advance has been made in certain directions. Apart from the employment of all the modern military and naval inventions, native-armed steamships have become common enough; the telegraphs are rapidly extending all over the country, and only last week a telegraph office was opened at Pekin itself. Railways are to be introduced gradually, and the correspondent narrates the story of an attempt to work coal-mines on Western methods. The Kaiping mines, which are specially referred to, have not been altogether a financial success, on account of the difficulties of transport, the necessity of constructing a rough canal for part of the way, and the refusal of the authorities to permit of the regular employment of steam locomotives between the mines and the nearest waterway. Still the experiment is stated to be full of hope, for the causes which have rendered it a loss to its promoters can be remedied, it is said, by a stroke of the pen.

A RECENT number of the *China Review* contains an article on the Chinese and Japanese plants found in Normandy. During a recent holiday in Europe the writer, M. Fauvel, was struck by the quantity of exotic and even sub-tropical plants cultivated there, and amused himself by searching for the Chinese and Japanese species. The district examined was chiefly that round Cherbourg. The paper describes first the trees and shrubs, which are in a majority, and then refers to the herbaceous flowers and plants, ornamental and useful. Among these were the *Camellia japonica*, the *Chamærops excelsa*, or Chinese palm, the deciduous magnolias of China, *Paulownia imperialis*, wistaria, the rhododendrons and azaleas of China and Japan, the Japanese quince (*Cydonia japonica*), and many others, all of which will be found noted in a paper which may be read with interest by many who take but a limited interest in botany.

DR. CHARLES CLAY contributes to the *Chemical News* of August 8 an interesting reminiscence of Dalton. Dr. Clay was a pupil of Dalton's, and he tells very graphically his adventures in search of four bottles of fire-damp, for which he had to proceed from Manchester to Oldham.

A GROTTO, from 8 to 10 metres high, has been discovered in a rock, washed by the sea, in the Morbihan, by M. Gaillard. He has since continued his researches, at low water, and found some human bones, ancient earthenware marked with allegorical figures, and coins believed to have been struck by the early Gauls.

THE National Electrical Commission, *Science* states, met in Philadelphia on August 7. It was decided that the Conference to be conducted by the Commission will be called for Monday, September 8, to be then continued from day to day, as may be found necessary. The invitations to the Conference will be confined to physicists of eminence, and to experts in the practical management of electrical appliances and apparatus. It is proposed to extend special invitations to prominent foreign visiting electricians. It was also decided to issue a circular inviting the conferees to submit a paper to be read before the Conference. It is not definitely known what subjects will be discussed at the Conference, but the following matters have been suggested: the sources of electrical energy; the theoretical conditions necessary to the most efficient construction of the dynamo-electric machine for the various purposes of practical work; the electrical transmission of energy; the systems of arc and incandescent lighting; the theory of the electric arc, storage batteries, electro-metallurgy; lighthouses for the coast; applications of electricity to military and mining engineering; lightning protection; induction in telephone lines, and the problem of long-distance telephoning; the question of underground wires; atmospheric electricity; earth-currents and terrestrial magnetism; photometry and standards for photometric measurements; the ratio of the electro-magnetic to the electro-static system of units, and the electro-magnetic theory of light; and finally, on account of the pressing necessity for accurate and uniform electrical measurements, it is probable that the question of establishing a National Bureau of Physical Standards will receive proper attention.

THE additions to the Zoological Society's Gardens during the past week include a Gelada Baboon (*Theropithecus gelada* ♀) from the Province of Amara, Abyssinia, presented by H. E. Lidge, Mercha Workee, Abyssinian Envoy; a Red-crested Cardinal (*Paroaria cucullata*) from South America, presented by Mr. John W. Miers; an African Elephant (*Elephas africanus* ♂) from Abyssinia, deposited by Her Majesty the Queen; two Cape Hunting Dogs (*Lycaon pictus*) from South Africa, two Picui Doves (*Columbula picui*) from South America, deposited; a Common Cormorant (*Phalacrocorax carbo*), British, received in exchange.

OUR ASTRONOMICAL COLUMN

COMET 1884 *b* (BARNARD, JULY 16).—Herr Stechert of Kiel has ascertained that the apparent deviation of the orbit of this comet from a parabola, mentioned last week, is due to error in the telegraphed position on the night of discovery, and that observations between July 23 and August 10, at Algiers and Rome, are well represented by the following parabolic elements:—

Perihelion passage, 1884 August 18·18264 G.M.T.

	° ′ ″	
Longitude of perihelion	303 31 27	M.Eq.
,, ascending node ...	357 40 19	1884·0
Inclination	6 52 12	
Log. perihelion distance	0·140670	

Motion—direct.

Small inclination and direct motion have long been considered to favour periodicity, though we now have some striking exceptions. In the above orbit the comet, in approaching the sun, passes very near to the orbit of the planet Jupiter; thus, at a true anomaly of 240° 30′, corresponding to heliocentric longitude 184°, the distance of the two orbits is less than 0·2 of the earth's mean distance from the sun, and the comet is, at this point of its track, 454 days before perihelion passage, or on the last occasion in May 1883, when the planet was far distant.

The following positions for midnight at Berlin have been calculated by Herr Stechert:—

	R.A.	N.P.D.	Log. distance from Earth
	h. m.	° ′	
Sept. 15	19 21·4	119 23	9·8470
16	— 25·4	119 3	
17	— 29·3	118 43	9·8548
18	— 33·2	118 22	
19	— 37·1	118 1	9·8629
20	— 40·9	117 40	
21	— 44·7	117 19	9·8713
22	— 48·5	116 57	
23	19 52·2	116 35	9·8801

The above elements also give these positions:—

12h. G.M.T.	R.A.	N.P.D.	Distance from Earth.	Distance from Sun.
	h. m.	° ′		
Oct. 20	21 18·7	105 55	1·041	1·656
Nov. 19	22 29·9	97 55	1·504	1·912

The intensity of light on October 20 is 0·34, that on November 19, 0·12, its value at discovery on July 16 being 1·16.

M. Perrotin has made the following observation:—

M.T. Nice	R.A.	N.P.D.
h. m. s.	h. m. s.	° ′ ″
August 15, 8 48 54	17 13 6·79	126 28 28·4

He remarks: "La comète a l'aspect d'une nebulosité assez mal définée de 1′ 30″ de diamètre environ, présentant des granulations brillantes vers le centre."

KEPLER'S NOVA OF 1604.—Those who have taken interest in the actual configuration of stars near the place of the famous *Stella nova in pede Serpentarii* will be aware that Chacornac has a star of the tenth magnitude (or perhaps of the ninth, the symbol being a little ambiguous) in a position near that of the